Claims

[c1] 1. A multi-layered substrate having a voltage reference signal circuit layout therein, comprising:
a first layer having a plurality of signal traces;
a second layer having at least one conductive plane;
a third layer having at least one conductive plane and a voltage reference signal trace; and
a fourth layer having a plurality of signal traces.

[c2] 2. The multi-layered substrate of claim 1, wherein the conductive plane at the second layer is a ground plane.

[c3] 3. The multi-layered substrate of claim 1, wherein the conductive plane at the second layer is a power plane.

[c4] 4. The multi-layered substrate of claim 1, wherein the conductive plane at the third layer is a ground plane.

[c5] 5. The multi-layered substrate of claim 1, wherein the conductive plane at the third layer is a power plane.

[c6] 6. The multi-layered substrate of claim 1, wherein the voltage reference signal trace is surrounded by the conductive plane at the third layer.

[c7] 7. The multi-layered substrate of claim 1, wherein the substrate further at least one layer having a plurality of signal traces between the second layer and the third layer.

[c8] 8. The multi-layered substrate of claim 1, wherein the substrate further a layer having at least one ground plane and a plurality of signal traces between the first layer and the second layer.

[c9] 9. The multi-layered substrate of claim 1, wherein the substrate further a layer having at least one power plane and a plurality of signal traces between the third layer and the fourth layer.

[c10] 10. The multi-layered substrate of claim 1, wherein the first layer further

includes a voltage reference signal trace.

[c11] 11. A multi-layered substrate having a voltage reference signal circuit layout therein, comprising:
a first signal layer having a plurality of signal traces;
a second signal layer having a plurality of signal traces; and
at least one non-signaling layer between the first signal layer and the second signal layer, wherein a voltage reference signal trace is in one of the non-signaling layers.

[c12] 12. The multi-layered substrate of claim 11, wherein the non-signaling layer includes at least one power plane.

[c13] 13. The multi-layered substrate of claim 11, wherein the non-signaling layer includes at least one ground layer plane.

[c14] 14. The multi-layered substrate of claim 11, wherein the non-signaling layer includes at least one power plane and a plurality of signal traces.

[c15] 15. The multi-layered substrate of claim 11, wherein the non-signaling layer includes at least one ground layer plane and a plurality of signal traces.

[c16] 16. A multi-layered substrate having a voltage reference signal circuit layout therein, comprising:
at least one signal layer having a plurality of signal traces;
a non-signaling layer having a voltage reference signal trace; and
a conductive plane between the signal layer and the non-signaling layer.

[c17] 17. The multi-layered substrate of claim 16, wherein the non-signaling layer includes at least one power plane.

[c18] 18. The multi-layered substrate of claim 16, wherein the non-signaling layer includes at least one ground layer plane.

[c19] 19. The multi-layered substrate of claim 16, wherein the non-signaling layer includes at least one power plane and a plurality of signal traces.

[c20] 20. The multi-layered substrate of claim 16, wherein the non-signaling layer

includes at least one ground layer plane and a plurality of signal traces.

[c21] 21. The multi-layered substrate of claim 16, wherein the conductive plane includes a ground plane.

[c22] 22. The multi-layered substrate of claim 16, wherein the conductive plane includes a power plane.

[c23] 23. A multi-layered substrate having a voltage reference signal circuit layout therein, comprising:
at least one signal layer having a plurality of signal traces; and
at least one non-signaling layer having a voltage reference signal trace.

[c24] 24. The multi-layered substrate of claim 23, wherein the non-signaling layer includes at least one ground layer plane.

[c25] 25. The multi-layered substrate of claim 23, wherein the non-signaling layer includes at least one power plane and a plurality of signal traces.

[c26] 26. The multi-layered substrate of claim 23, wherein the non-signaling layer includes at least one ground layer plane and a plurality of signal traces.